

ZELYAKH, E.V.

CIRCUITS

"Electric Filters with Resonators of Synthetic Crystals" by
Ya. I. Velikin and E. V. Zelyakh, Elektrosvyaz', No 11, November
1957, pp 89-100.

Somewhat obsolete article (delivered at the First All-Union Conference on Piezoelectricity on November 27, 1952, on the development of electric filters for 12-channel carrier telephone system, in which synthetic crystals replace the quartz in the piezoelectric resonators.

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SOV/106-58-9-7/17

AUTHOR: Zelyakh, E.V.

TITLE: The Station-A Crystal Blocking Filter of a 12-Channel High-Frequency Telephony System (Zagrazhdayushchiy kvartsevyi fil'tr stantsii A 12-kanal'noy sistemy vysokochastotnogo telefonirovaniya)

PERIODICAL: *Elektrosvyaz*, 1958, Nr 9, pp 44 - 50 (USSR)

ABSTRACT: The purpose of this filter is to suppress the residual leakage of carriers at 60, 64 108 kc/s which come through from the modulators of the individual channels. A simplified circuit diagram of the filter is shown in Fig 1. A typical response curve is shown in Fig 2. The lower scale of this figure shows in more detail the shape of the responses at certain frequencies. In spite of the importance of this filter in a multi-channel system the literature on it is extremely limited. The purpose of this paper is to provide an analysis and a method of design. Figs 3 and 4 show the familiar equivalent circuits for a crystal element and equations (7) and (8) give alternative forms of the expression for the ratio of the two resonant frequencies of the crystal. An

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important parameter here is the ratio of the "surface" to "internal" capacitances of the crystal. For plates cut at an angle of -18.5° the parameter has a value of 140 and for a $+5^\circ$ cut it has a value of 125. At frequencies sufficiently remote from the carrier frequency, i.e. lying in the pass-bands of the channels, the circuit of Fig 5 is a good representation of the filter action. It will be seen that it is in effect a 2-section m-derived filter. Equation (10) gives the circuit values in terms of cut-off frequency and m. Equation (15) is an expression for the attenuation due to the filter and (16) is its particular value at the cut-off frequency. In the neighbourhood of the carrier frequencies where the attenuation is much greater Fig 6 is a better approximation to the circuit and this may be further reduced to Fig 7. The additional circuit attenuation due to the rapid change in crystal admittance is given by (17), the constituent parts of which are defined in (19) - (22). The attenuation at the carrier

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frequency itself is given by (28). The design of the crystal element may be undertaken from (39) for the inductance, (40) for the resistance, and (41) for the series capacitance. The work was ~~done by~~ A.D. Fedorov under the guidance of YanI. Velikin.

There are 7 figures and 4 references, all Soviet.

ASSOCIATION: Leningradskoye otdeleniye nauchno-issledovatel'skogo instituta svyazi Ministerstva svyazi, A.D. (Leningrad Division of the Scientific Research Institute of Communications of the Ministry of Communications,

SUBMITTED: April 21, 1958

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ZELYAKH. E. M.

Н. В. Суздальцев

Полупроводниковые лампы в системах радиотелевизионной связи.

11 июня
(с 10 до 16 часов)

Н. Н. Алексеев

Синхронизация элементов полупроводниковых систем на магнетронной базе.

Н. В. Шадрин

Экспериментальное и теоретическое исследование закона сложения девиаций шумов в каналах радиотелевизионной связи.

А. М. Мещков

Анализ одной из схем радиотелевизионной системы в магнетронной базе.

Н. Н. Егоров

О влиянии частотной нестабильности на качество телепередачи с частотной модуляцией.

11 июня
(с 10 до 16 часов)

22

Н. Н. Акулиничев

Влияние шума тротуа на качество телепередачи в магнетронной базе.

А. Д. Алексеев

Влияние радиотелевизионной системы на качество телепередачи.

Н. Н. Волков

Закон сложения девиаций шумов в каналах радиотелевизионной связи.

Н. Н. Мещков

А. Д. Егоров

Организация связи по ВЧ каналам радиотелевизионной системы, работающей в магнетронной базе.

11 июня
(с 16 до 22 часов)

А. В. Зюков

О влиянии частотной нестабильности на качество телепередачи с частотной модуляцией.

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report submitted for the Centennial Meeting of the Scientific Technological Society of
Radio Engineering and Electrical Communications in. A. S. Popov (VSEKH), Moscow,
6-12 June. 1959

20406

9.3240 (2301, 2901, 2902, 2104)

S/109/60/005/012/004/035
E192/E482

AUTHORS: Zelyakh, E.V. and Lur'ye, B.Ya.

TITLE: A Method for the Physical Realization of an Ideal Power Converter

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.12, pp.1895-1901

TEXT: The conception of an ideal power converter as a circuit element was introduced by Zelyakh in 1957 (Ref.1). It is a two-port with matrix

$$\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} = \begin{bmatrix} \frac{1}{K} & 0 \\ 0 & \frac{1}{K} \end{bmatrix}$$

(a)

Connected in cascade with other two-ports it increases the signal by a factor of K in one direction and by $1/K$ in the other, independently of the input impedances of the two-ports on either side. Its input impedance is identical with that of the load connected across the output terminals. It was shown (Ref.2) that

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A Method for the Physical ...

any irreversible two-port can be reduced to a reversible two-port in cascade with an ideal power converter. The physical realization of ideal power converters is the subject of the present article. Analysis shows that the circuit of Fig.1 will behave as an ideal power converter under certain conditions. The matrix of Fig.1b is

$$[a] = \begin{bmatrix} \frac{1}{\mu - s} & 0 \\ 0 & \frac{s}{\mu - s} \end{bmatrix}$$

(b)

With $s = 1$ this is the matrix of the ideal power converter with $\mu - 1 = K$. With $s \neq 1$ the circuit is equivalent to the cascade connection of an ideal converter and an ideal transformer. For K to be a real quantity, it is necessary that μ , Z_1 , sZ_1 , Z_2 and Z_3 be real and positive. Stable and real μ over a working bandwidth requires the use of a negative feedback amplifier. If the amplifier is not rigorously unilateral, back-transmission of the signal from the output to the input terminals may be compensated by adjustment of Z_2 and Z_3 . A pentode circuit
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A Method for the Physical ...

modelling Fig.1b is given in Fig.3. The ratio of input to output impedances is very close to unity below 1 M Ω . The authors list several applications in measurement techniques. The most interesting application is as a negative-resistance amplifier (Fig.4 and 5). Bridging the converter (Fig.4) gives a short-circuit-stable negative-resistance amplifier, putting the impedance in the common lead (Fig.5) gives an open-circuit-stable amplifier. The article closes with stability considerations. There are 5 figures, 1 table and 5 references: 4 Soviet and 1 non-Soviet.

SUBMITTED: May 7, 1960

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A Method for the Physical ...

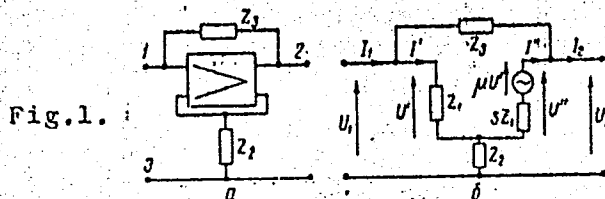


Рис. 1. Схема, при определенных условиях эквивалентная идеальному преобразователю мощности

Fig. 3.

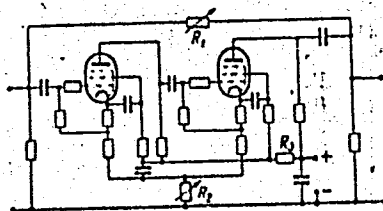


Рис. 3. Принципиальная схема устройства, обладающего свойствами идеального преобразователя мощности

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A Method for the Physical ...

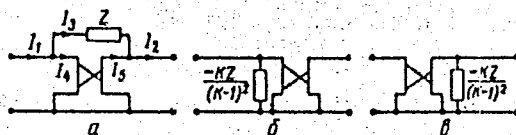


Fig. 4.

Рис. 4. Идеальный преобразователь мощности как конвертор отрицательных сопротивлений, устойчивых при коротком замыкании

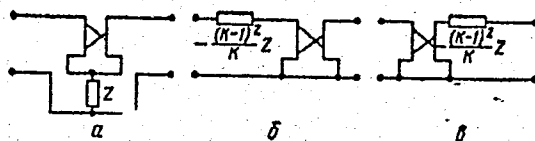


Fig. 5.

Рис. 5. Идеальный преобразователь мощности как конвертор отрицательных сопротивлений, устойчивых при холостом ходе

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21199
S/106/60/000/007/002/003/XX
A189/A133

9.3210 (2962, 1031, 1132)

AUTHOR: Zelyakh, E. V.

TITLE: On the stability analysis of tube and transistor circuits

PERIODICAL: Elektrosvyaz', no. 7, 1960, 47-59

TEXT: The author describes a method of finding out the characteristic equation of a linear electric circuit, which is required for the circuit stability analysis. The method consists in the representation of the circuit as a quadripole. The purpose of this work is to give a theoretical basis of this method, the foundation for which was laid by the author already in 1929 [Ref. 5: Zelyakh, E. V., "Raschet transformatornykh fil'trov" (Calculation of Transformer Filters) (graduation thesis), LETI, 1929]. Theoretically, the method is based on the following five theorems. Theorem I: If a linear electric circuit is reduced to a quadripole with short-circuited poles at both ends, then its characteristic equation has the form

$$|z| = 0$$

(1)

where $|z|$ = determinant

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On the stability analysis of...

$$|z| = \begin{vmatrix} z_{11} & z_{12} \\ z_{21} & z_{22} \end{vmatrix} \quad (2)$$

formed from the equation factors of the quadripole

$$\begin{cases} \dot{U}_1 = z_{11}\dot{I}_1 + z_{12}\dot{I}_2 \\ \dot{U}_2 = z_{21}\dot{I}_1 + z_{22}\dot{I}_2 \end{cases} \quad (3)$$

\dot{U}_1 and \dot{I}_1 represent the voltage and current in the left branch and \dot{U}_2 and \dot{I}_2 - in the right branch of the quadripole. Theorem II: If an electric linear circuit is reduced to a quadripole with opened poles, then its characteristic equation has the form

$$|y| = 0 \quad (6)$$

where $|y|$ = determinant

$$|y| = \begin{vmatrix} y_{11} & y_{12} \\ y_{21} & y_{22} \end{vmatrix} \quad (7)$$

formed from the equation factors of the quadripole

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21199
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A189/A133

On the stability analysis of...

$$\left. \begin{aligned} \dot{I}_1 &= y_{11}\dot{U}_1 + y_{12}\dot{U}_2 \\ \dot{I}_2 &= y_{21}\dot{U}_1 + y_{22}\dot{U}_2 \end{aligned} \right\} . \quad (8)$$

Theorem III: If an electric linear circuit is reduced to a quadripole having short-circuited poles at the left branch and open poles at the right branch, then its characteristic equation has the form

$$|d| = 0 \quad (9)$$

where $|d|$ = determinant

$$|d| = \begin{vmatrix} d_{11} & d_{12} \\ d_{21} & d_{22} \end{vmatrix} \quad (10)$$

formed from the equation factors of the quadripole

$$\left. \begin{aligned} \dot{U}_1 &= d_{11}\dot{U}_2 + d_{12}\dot{I}_1 \\ \dot{I}_2 &= d_{21}\dot{U}_2 + d_{22}\dot{I}_1 \end{aligned} \right\} . \quad (11)$$

Theorem IV: If an electric linear circuit is reduced to a quadripole having short-circuited poles at the right branch and opened poles at the left branch, then its characteristic equation has the form

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On the stability analysis of...

$$|f| = 0 \quad (14)$$

where f = determinant

$$|f| = \begin{vmatrix} f_{11} & f_{12} \\ f_{21} & f_{22} \end{vmatrix} \quad (15)$$

formed from the equation factors of the quadripole

$$\begin{cases} \dot{U}_2 = f_{11}\dot{U}_1 + f_{12}\dot{I}_2 \\ \dot{I}_1 = f_{12}\dot{U}_1 + f_{22}\dot{I}_2 \end{cases} \quad (16)$$

Theorem V: If an electric linear circuit is reduced to a ring circuit, then its characteristic equation has the form

$$a_{11} + a_{22} = |a| + 1 \quad (17)$$

where $|a|$ = determinant

$$|a| = \begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix} \quad (18)$$

formed from the equation factors of the quadripole

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On the stability analysis of...

$$\left. \begin{aligned} \dot{U}_1 &= a_{11}\dot{U}_2 + a_{12}\dot{I}_2 \\ \dot{I}_1 &= a_{21}\dot{U}_2 + a_{22}\dot{I}_2 \end{aligned} \right\} \quad (19)$$

Proofs for the above mentioned theorems are given. Tables list the characteristic equations of the quadripoles for the different connections of its poles, the characteristic equations for some circuits containing an ideal tube or semiconductor period and characteristic equations for some ring circuits containing a tube, or a transistor, connected to a reversible quadripole. Examples of practical application of this method are given. Appendix 1 gives matrices of an electron tube connected as a quadripole. Appendix 2 gives matrices for a transistor in an equivalent T-circuit with a common base. There are 10 figures, 5 tables, and 15 references: 13 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: 1) Oakes, "Analysis of junction transistor audio oscillator circuits", Proc. IRE, vol. 42, no. 8, 1954. 2) Honnell, "The generalized transmission matrix stability criterion", Trans. AIEE, vol. 70, 1951. ✓

SUBMITTED: March 10, 1960.

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89829

S/106/60/000/011/004/010
A055/A033

9,7550

AUTHORS: Velikin, Ya.I., Gel'mont, Z.Ya., and Zelyakh, E.V.

TITLE: A Piezoelectric Band-Elimination Filter Circuit.

PERIODICAL: Elektrosvyaz', 1960, No.11, pp. 34-39

TEXT: The band-elimination quartz filters have usually a comparatively low impedance in the region of the suppressed frequencies. In some practical cases, it is sometimes necessary, however, for the filter to have a considerable impedance in the suppressed band. Two such filter circuits, containing one and two piezoelectric resonators respectively (see Fig. 1a and 1b) are described in the present article. These filter circuits have really two suppression bands: a wide one and a narrow one. The narrow band, in the region of the antiresonance frequency of the resonator (shunted by a capacitance), is the principal one and is used for the suppression of currents of given frequencies. Its width is somewhat larger in the circuit containing two resonators. Using equivalent circuits for his discussion, the author calculates the effective attenuation in the suppression band. He establishes first a general formula for the case of the filter circuit con-

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A Piezoelectric Band-Elimination Filter Circuit.

taining two resonators, and then applies this formula to the filter circuit with one resonator. He then works out a corresponding formula for the effective attenuation in the transmission band of the filters. Formulae are also given allowing to calculate the input impedance of the filter circuit (containing two resonators) in the case of the suppressed band and in the case of the pass-band (simplified approximate formulae being used in this latter case). At the end of the article, some general recommendations are given as to the calculation of the filter circuits and the choice of the piezoelectric resonators. There are 7 figures and 6 references: 5 Soviet and 1 non-Soviet.

SUBMITTED: May 3, 1960

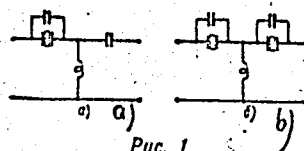


Рис. 1

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82865
S/108/60/015/008/002/006
B012/B067

9.3240

AUTHOR: Zelyakh, E. V., Member of the Society
TITLE: A New Theory of the Autonomous Four-pole and Its
Application to an Amplifier With Distributed Amplification
PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 8, pp. 13-24

TEXT: The fundamentals of the present paper were outlined on April 26, 1954, at the Scientific-technical Conference of the Leningradskiy elektrotekhnicheskii institut svyazi im. M. A. Bonch-Bruyevicha (Leningrad Electrotechnical Institute of Communications imeni M. A. Bonch-Bruyevich) and on May 13, 1958, at the All-Union Scientific Session of the NTORiE im. A. S. Popova (NTORiE imeni A. S. Popov) held in Moscow on the occasion of the Day of Radio. In his earlier papers (Refs. 1,2) the author developed the theory of an autonomous four-pole. A four-pole containing independent energy sources is termed an autonomous four-pole. Such a four-pole independently produces (autonomous) voltages and currents at its external terminals. The theory is based on the use of no-load

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A New Theory of the Autonomous Four-pole and
Its Application to an Amplifier With
Distributed Amplification

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voltages and short-circuit currents (measured at the terminals of the four-pole switched off from the current circuit) as autonomous parameters. Together with the coefficients of the four-pole equations these parameters allow the calculation of various regular four-pole systems if there are no restrictions concerning the selection of these systems. In practice, however, certain restrictions are imposed for simplifying the calculation in various systems. In the paper (Ref. 3) such a calculation was made for nonautonomous four-poles. Here, a similar system of parameters is given for autonomous four-poles. Only autonomous circuits whose "body" is a symmetrical four-pole are dealt with. The "body" of an autonomous four-pole is the nonautonomous four-pole which is obtained from the corresponding autonomous four-pole if in the latter the control voltages and the control currents of all independent sources are assumed to vanish. New parameters are introduced for the autonomous four-pole which are termed characteristic voltages and currents. The author established the relation between the latter and the other autonomous parameters. In the following, the theory of a cascade circuit

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of accordant autonomous four-poles with symmetrical bodies is set up. Formulas for calculating the voltages and currents at the current circuit terminals are derived for any loads. Tables 1-5 show formulas for the characteristic voltages and currents of some typical four-poles. To illustrate the theory explained it is applied to analyzing an amplifier with distributed amplification (Fig. 14). Formulas for the amplification coefficient of the amplifier are derived taking account of the mismatch at both ends of the grid- and anode current circuit. It is shown that the analysis made on the basis of the theory of autonomous characteristic parameters is simpler and more illustrative than the analysis of the amplifier of papers (Refs. 5,6), and that more general results are obtained. It is pointed out that the theory presented here may also be used for analyzing receiving antennas, lines with noises, etc. There are 16 figures, 5 tables, and 8 references: 6 Soviet and 2 US.

SUBMITTED: June 12, 1959

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30136
S/194/61/000/007/061/079
D201/D305

9.3230 (11321159)

AUTHOR: Zelyakh, E.V.

TITLE: Signs of the characteristic parameters of symmetrical four-poles containing negative resistances

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 7, 1961, 9, abstract 7 I72 (V sb. 100 let so dnya rozhd. A.S. Popova, M., AN SSSR, 1960, 160-170)

TEXT: The characteristic parameters of symmetrical fourpoles (F) (the characteristic impedance Z_c and the char. transmission constant g_c) are expressed by radicals, whose choice of signs is of importance both in theory and practice. The present work is an endeavor to make this problem completely clear. By considering the known F equations

$$\dot{U}_1 = \operatorname{ch} g_c U_2 + Z_c \operatorname{sh} g_c \dot{I}_2$$

$$\dot{I}_1 = \frac{1}{Z_c} \operatorname{sh} g_c \dot{U}_2 + \operatorname{ch} g_c \dot{I}_2$$

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Signs of the characteristic...

it is shown that the sign of one of the characteristic parameters is closely related to that of the other. The latter of the signs may be determined either analytically or graphically. In the analytical determination of signs of the charact. parameters, formulae are used which relate to each other Z_c and g_c and any other single valued parameters of F_1 e.g.

$$\frac{Z_c}{th g_c} = Z_{x.x}; Z_c th g_c = Z_{k.3}$$

The graphical sign determination is based on topological properties of $Z_{x.x}$ and $Z_{k.3}$ as formulated by Feldtkeller. Several theorems based on the theory introduced above, are given. These theorems make it possible to determine directly for many F the signs of charact. parameters. Examples of application of the theory are given. 5 references. [Abstracter's note: Complete translation]

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9.2186 (1063, 1159)
9.3230 (1132, 1040)

29587
S/108/61/016/011/003/007
D201/D304

AUTHORS: Velikin, Ya.I., Gel'mont, Z.Ya., and Zelakh E.V.,
Members of the Society

TITLE: Narrow-band lattice crystal filters

PERIODICAL: Radiotekhnika, v. 16, no. 11, 1961, 26 - 33

TEXT: In the present article design formulae are derived for lattice filters consisting of a piezoelectric crystal and a capacitor and forming a single, two-, three and four-section networks. The analysis of the filters is made using basic Π - and T-sections, as shown in Figs. 1a and 2a. Although design formulae for the above configuration are given in literature, for narrow pass-band filters, in which the ratio of the pass-band to its center frequency is smaller than e.g. 0.05, simpler approximate formulae may be used obtained by the method similar to that given by V. Zelakh (Ref. 6: Metod rascheta ekvivalentnykh skhem (Method of Designing Equivalent Circuits), Nauchno-tekhn. sb. po elektrosvyazi Leningr. in-ta svyazi no. 6, 1946). These formulae are as follows: for Π -section

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Narrow-band lattice crystal filters

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$$C_1 \approx \frac{1 - m^2}{4\pi m f_a R_{nom}} \quad (1)$$

$$C_2 \approx \frac{m}{2\pi f_a R_{nom}} \quad (2)$$

$$C_q \approx \frac{\Delta}{2\pi m f_a^2 R_{nom}},$$

$$L_q \approx \frac{m R_{nom}}{2\pi \Delta};$$

for T-section

$$C_1 \approx \frac{m}{2\pi f_a R_{nom}},$$

$$C_2 \approx \frac{1}{\pi (m^2 - 1) f_a R_{nom}},$$

$$C_q \approx \frac{2m^3 \Delta}{\pi (m^2 - 1)^2 f_a R_{nom}},$$

$$L_q \approx \frac{(m^2 - 1)^2 R_{nom}}{8\pi m^3 \Delta}.$$

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For both cases

$$m = \sqrt{\frac{f_2^2 - f_\infty^2}{f_1^2 - f_\infty^2}} \quad (3)$$

and $\Delta = f_2 - f_1, f_a = \frac{1}{2}(f_1 + f_2)$ (4)

where f_1 and f_2 out-off frequencies, f_∞ - frequencies of the attenuation band, R_{nom} - characteristic filter impedance at frequency f_a .
For narrow-band filters, as frequencies near f_a

$$m \approx \sqrt{\frac{f_2 - f_\infty}{f_1 - f_\infty}} \quad (5)$$

may be assumed and hence, introducing

$$\Delta_\infty = 2(f_\infty - f_a), \quad t = \frac{\Delta_\infty}{\Delta} \quad (6)$$

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the approximate expression for m is obtained as

$$m \approx \sqrt{\frac{\frac{1}{t} - \frac{1}{1}}{\frac{1}{t} + \frac{1}{1}}}, \quad (7)$$

which is the generalized equation (does not contain frequency). The attenuation of the single section filter is derived as

$$N \approx \frac{1}{2} \sqrt{t^2 - 1} \frac{\frac{1}{\alpha} - \alpha + (\frac{1}{\alpha} + \alpha)\eta}{\eta - t} \quad (22)$$

where $\alpha = \frac{R_o}{R_{nom}}$, and η given by

$$\eta = \frac{f - f_a}{\frac{1}{2} \Delta} \quad (19)$$

- the normalized frequency (Ref. 6: Op. cit.). For the two-section filter the anntenuation is derived as

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Narrow-band lattice crystal filters

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$$N \approx \sqrt{t^2 - 1} \frac{[\frac{1}{\alpha} - \alpha + (\frac{1}{\alpha} + \alpha)\eta](\eta t - 1)}{(\eta - t)^2}, \quad (27)$$

for three-section

$$N \approx \frac{1}{2} \sqrt{t^2 - 1} [\frac{1}{\alpha} - \alpha + (\frac{1}{\alpha} + \alpha)\eta] \frac{4(\eta t - 1)^2 - (t - \eta)^2}{(t - \eta)^3} \quad (35)$$

and four-section as

$$N \approx 2 \sqrt{t^2 - 1} [\frac{1}{\alpha} - \alpha + (\alpha + \frac{1}{\alpha})\eta](\eta t - 1) \frac{2(\eta t - 1)^2 - (\eta - t)^2}{(\eta - t)^4};$$

Each of them simplifies according to the values of load and the respective values of η and t . The above filter circuits may, in particular be used for crystal filters at frequencies above 1 mc/s, with transverse oscillating crystals of AT and BT cut. Experimental two- and three- Π -section filters operating at the center pass-band frequency of 1364 kc/s had a pass band of 800 c/s. There are 8 figures and 7 references: 4 Soviet-bloc and 3 non-Soviet-bloc. The

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Narrow-band lattice crystal filters

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reference to the English-language publication reads as follows: R. A. Sykes, IRE National Convention; part 2, 1958.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A.S. Popova (Scientific and Technical Communication im. A.S. Popov) [Abstractor's note: Name of Association taken from 1st page of journal]

SUBMITTED: April 29, 1960 (initially)
July 7, 1961 (after revision)

Fig. 1.

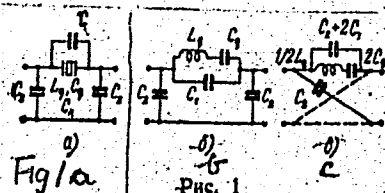
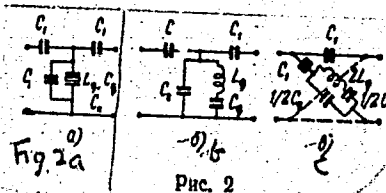


Fig. 2.



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S/106/62/000/002/008/010
A055/A101

9.2/86

AUTHORS: Velikin, Ya. I., Zelyakh, E. V., Ivanova, A. I.

TITLE: Single-mesh narrow-band magnetostrictive filters

PERIODICAL: Elektrosvyaz', no. 2, 1962, 51 - 59

TEXT: In the present article are described some of the results of the study of magnetostrictive ferrite-core resonators and of filters composed of such resonators, undertaken by the authors. Only single-mesh narrow-band filters are examined in this article, by the analytical method already described by two of the authors (Zelyakh and Velikin, Radiotekhnika, no. 7 - 8, 1946). The schematic diagram of these filters is shown in Fig. 1a, Fig. 1b being its equivalent circuit. Neglecting, as a first approximation, the losses in the filter elements, the authors derive expressions permitting the calculation of the filter elements L_{01} , L_{02} , L_1 , L_2 , C_1 and C_2 (or the elements L_0 , L , C_1 and C_2 when $L_1 = L_2 = L$ and $L_{01} = L_{02} = L_0$). They next calculate the components of the magnetostrictive resonator impedance $Z = R + iX$. Formulae are deduced, first for R_1 and X_1 and then for R_2 and X_2 , i.e. for the resistance and reactance of the resonators forming the first and the second arm of the filter, respectively. Ex-

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Single-mesh narrow-band magnetostrictive filters

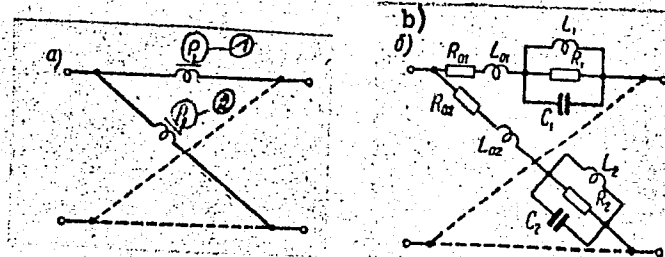
S/106/62/000/002/008/010
A055/A101

perimental checks proved that the values of the resistances and reactances calculated with the aid of these formulae are sufficiently correct. In the third chapter of the article, the authors determine the working attenuation of the examined filters in two cases: 1) without taking into account the losses in the resonators, 2) account taken of these losses. The results of an experimental investigation of some magnetostrictive filters designed according to the described method are reproduced at the end of the article. There are 10 figures and 5 references; 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: Burgt. Piezomagnetic ferrites. Electronic Technology, 1960, v. 37, no. 9. The Soviet authors or scientists mentioned in the article are: S. S. Kogan, N. D. Bosyy.

SUBMITTED: June 23, 1961

Figure 1.
Legend 1 - Res₁
2 - Res₂

Card 2/2



36087

S/106/62/000/004/007/010
A055/A101

9.2/86

AUTHORS: Velikin, Ya.I.; Zelyakh, E.V.; Ivanova, A.I.

TITLE: Rejection magnetostrictive filters

PERIODICAL: Elektrosvyaz', no. 4, 1962, 48 - 54

TEXT: A method for calculating bridge-type rejection filters consisting of magnetostrictive resonators and condensers is described. The rejection magnetostrictive filter is shown schematically in Figure 1, the resonator being replaced by its equivalent circuit (the losses in the filter elements are neglected). The impedances of the arms are:

$$Z_1 = i 2 \pi f L_0 \frac{f_2^2 - f^2}{f_1^2 - f^2}; \quad Z_2 = \frac{1}{i 2 \pi f C_2}, \quad (1)$$

where f_1 and f_2 are, respectively, the antiresonant and the resonant frequency of the resonator. The filter characteristic impedances Z_{c0} and $Z_{c\infty}$ (at $f = 0$ and $f \rightarrow \infty$, respectively) being but little different, the rated impedance of the filter is taken equal to

Card 1/4

Rejection magnetostrictive filters

S/106/62/000/004/007/010
A055/A101'

$$Z_m = \sqrt{\frac{L_0}{C_2}} = \frac{R_0}{\alpha}, \quad (3)$$

R_0 being the load resistance and α the matching coefficient. The graphs showing the frequency-dependence of Z_1 , Z_2 , b_c (characteristic attenuation) and Z_c reveal that the examined circuit is a rejection filter whose characteristic rejection band is situated between the frequencies f_1 and f_2 . Within this band (at f_∞), occurs the attenuation pole, f_∞ being deduced from formula:

$$f_\infty^2 (f_2^2 - f_\infty^2) = F_0^2 (f_\infty^2 - f_1^2), \quad (4)$$

where

$$F_0 = \frac{1}{2\pi\sqrt{L_0 C_2}}. \quad (5)$$

The formulae permitting the calculation of the filter elements are:

$$L_0 = \frac{Z_m}{2\pi F_0}, \quad L_1 \approx L_0 \frac{2\Delta}{f_1}, \quad C_1 = \frac{1}{4\pi^2 f_1^2 L_1}, \quad C_2 = \frac{1}{2\pi F_0 Z_m}, \quad (6)$$

Card 2/4

Rejection magnetostrictive filters

S/106/62/000/004/007/010
A055/A101

$$F_0 = f_\infty \sqrt{\frac{f_2^2 - f_\infty^2}{f_\infty^2 - f_1^2}} \approx f_\infty \sqrt{\frac{f_2 - f_\infty}{f_\infty - f_1}} \quad (7)$$

$\Delta = f_2 - f_1$ being the width of the characteristic rejection band. The maximum width of the rejection band is:

$$\Delta_{\max} = \frac{1}{2} K^2 f_1 \quad (8)$$

K being the electromechanical coupling coefficient. The author next considers the case when two rejection bands are necessary (two series-connected magnetostrictive resonators being used) and deduces a formula giving Δ_{\max} for this case. He calculates then the working attenuation of the single-mesh filter. This attenuation is:

$$b_{\text{work}} = \ln \sqrt{1 + \frac{1 - t^2}{4} \frac{[(\alpha - \frac{1}{\alpha}) \eta + \alpha + \frac{1}{\alpha}]^2}{(\eta - t)^2}}, \quad (16)$$

where $t = \frac{\Delta_\infty}{\Delta}$, $\Delta_\infty = 2(f_\infty - f_a)$, $f_a = \frac{1}{2}(f_1 + f_2)$, $\eta = \frac{2(f - f_a)}{\Delta}$. An

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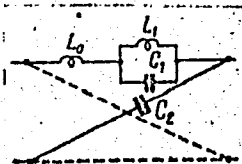
Rejection magnetostriuctive filters

S/106/62/000/004/007/010
A055/A101

analogous formula is also deduced for the working attenuation of the two-mesh filter. Some results of a practical application of the above formulae are given at the end of the article. The Soviet personalities mentioned in the article are: D.G. Yatsenko, T.M. Novikova, N.D. Bosyy. There are 9 figures and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc.

SUBMITTED: October 28, 1961

Figure 1b.



Card 4/4

ZELYAKH, E.V.

Use of equivalent transformations in the calculation of
electrical networks. Radiotekhnika 17 no.9:3-6 S '62.
(MIRA 15:9)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva
radiotekhniki i elektrosvyazi imeni A.S.Popova.
(Electric networks) (Equivalent circuits)

VELIKIN, Ya.I.; ZELYAKH, E.V.; IVANOVA, A.I.

Wide-band magnetostrictive filters. Elektrosviaz' 17 no.10:1-9 0
'63. (MIRA 17:1)

ZELYAKH, E.V.; KISEL', V.A.

Canonical schematics of two-terminal circuits consisting of two-terminal networks of two forms. Radiotekhnika 20 no.7:1-8 JI '65.
(MIRA 18:8)

1. Deystvitel'nyye chleny Nauchno-tehnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni Popova.

L 35854-66 EWT(1)
ACC NR: AP6010785

SOURCE CODE: UR/0106/66/000/002/0001/0008

AUTHOR: Velikin, Ya. I.; Zelyakh, E. V.; Ivanova, A. I.

33
B

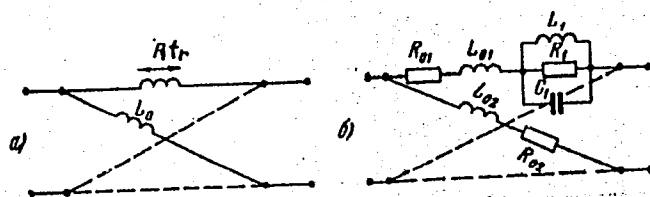
ORG: none

TITLE: Narrow-band magnetostriction filters

SOURCE: Elektrosvyaz', no. 2, 1966, 1-8

TOPIC TAGS: electric filter, magnetostriction filter

ABSTRACT: A method is developed for calculating single- and two-section magneto-



Actual
Magnetostriction-filter circuit

Equivalent

striction filters (MF) that have a bridge circuit and include one two-winding magnetostriction resonator and one doubly-wound inductance coil (see figure). Theoretical plots of characteristic impedance and attenuation of MF arms are shown. Formulas for the effective attenuation of single- and two-section MF's

Card 1/2

UDC: 621.372.542.22

L 35854-66

ACC NR: AP6010785

are developed. A 78-kc experimental two-section filter was tested; its attenuation characteristics are very close to those estimated by the authors' formulas. Orig. art. has: 10 figures, 30 formulas, and 1 table.

SUB CODE: 09 / SUBM DATE: 08Jul65 / ORIG REF: 005

Card 2/2 *mb*

ZELYAK, V.I.

Structural adaptation of the arterial bed in the esophagus under experimental conditions. Arkh.anat., gist. i embr. 47 no.10:56-61 (MIRA 18:6) 0 '64.

1. Kafedra normal'noy anatomii (zav. -- prof. Ye.P.Mel'man) Ivano-Frankovskogo meditsinskogo instituta.

ZELYAKH, G.E.

Evaluating the masses of globular clusters. Uch.zap.IGU
no.190:52-58 '57. (MLRA 10:7)
(Stars--Clusters)

ZELYAK, V.L.

Distribution and plasticity of intraorganic arteries in the
esophagus of dogs. Dop. AN URSR no. 6:814-817 '64.
(MIRA 17:9)

1. Ivano-Frankovskiy gosudarstvennyy meditsinskiy institut.
Predstavleno akademikom AN UkrSSR V.G.Kas'yanenko [Kas'ianenko,
V.H.].

ZELYAKOVA, D. I., Cand Med Sci — (diss) "Reaction of an organ affected with polonium to the action of arsenic," Moscow, 1960, 13 pp (Academy of Medical Sciences USSR)
(KL, 38-60, 110)

ZELYAKOV, N. V.

A. M. STEFANOVSKII, CR 3, 21-4, 1935

ZELYAKOVA, D.I.

Prophylactic effect of sodium arsenate in polonium poisoning.

Radiobiologiya 1 no.2:288-292 '61.

(POLONIUM--PHYSIOLOGICAL EFFECT) (MIRA 14:7)

(SODIUM ARSENATES)

ZELYAKOVA, D.I. (Moskva)

Interaction of arsenic and polonium compounds. Farm. i toks.
28 no.1:95 Ja-F '65. (MIRA 18:12)

1. Submitted September 5, 1963.

ZELYANKOVICH, V.M.

Their school is their home. Rab. i slal. 37 no. 11:14-15 H '61.
(MIRA 14:10)

1. Direktor Pruzhanskoy shkoly-internata.
(Pruzhany District--Boarding schools)

18

The dependence of the structures of a catalyst upon the condition of its reduction. N. V. Zelyansky, A. M. Stefanovskii and B. S. Tatarskii. *Solnshch. Tekhn. zhurn. Akad. Nauk SSSR* 1956, No. 2, 151.—The activity of an NH_3 catalyst prep'd. by the method of $\text{C}_2\text{H}_4\text{-O}$ fusion depends upon the reduction temp. With increase of this temp., the cryst. surface becomes more regular. During the reduction, rebuilding of the catalyst lattice and reduction of the size of the crystals to about 0.001 take place. The activity is decreased mainly as a result of changing the surface of the catalyst in connection with the increased regularity of the crystal lattice. B. V. Shvartzberg

Crystallohydrates of aluminum fluoride. V. S. Yaflov
and A. I. Zelvauskaya. *J. Gen. Chem.* (U. S. S. R.) 7,
1787 (1977). The coefficients of vapor pressure over
 AlF_3 contg. various ams of H_2O of crystn. from 3.18
to 0.40 mol. per mol. of AlF_3 , showed that in addn. to
 $\text{AlF}_3 \cdot 9\text{H}_2\text{O}$, which is stable at temps. up to 20°C , there
exist only the hydrates $\text{AlF}_3 \cdot 3\text{H}_2\text{O}$ and $\text{AlF}_3 \cdot 0.5\text{H}_2\text{O}$. The
existence of $\text{AlF}_3 \cdot 3.5\text{H}_2\text{O}$ and $\text{AlF}_3 \cdot \text{H}_2\text{O}$, described in the
literature, could not be confirmed. S. L. Madorsky

ZELYANSKAYA, A. I., RYSS, I. G. and SHUTOVA, V. M.

"Viscosity of Solutions of Alkali Chromates." Zhur. Prikl. Khim., 12, 1939.

ZELYANSKAYA, A. I., RYSS, I. G., and ZAYARNYY, A. E.

"Preparation of Crystallized Chromic Anhydride from Calcium Chromate."
Zhur. Prikl. Khim., 14, 46-61, 1941.

A boiling mixt. of 456 g./l. Na CrO₂, 29.6 g./l. Na SO₄ and traces of free alkali was treated with an equiv. quantity of a soln. contg. CaCl₂ 33, KCl 2.64, and KClO₃ 0.75%. The filtered and washed CaCrO₄ was decompd. with H₂SO₄ and the soln. of CrO₃ obtained was filtered and concd. to about 66%. Yield of CrO₃ was 97%-98%. The corrosion resistance of materials to be used as evaporators, reactors, etc., was found to be (loss in g./sq. m./hr. on exposure to process conditions for 0-2 and 2-4 hrs., resp.): Gray cast iron (C 3.39, Si 2.94, Mn 0.55, P 0.217 and S 0.06%) 6.58 and 2.65; boiler plate of the Chusovo mills (C 0.172, Mn 0.34, P 0.032, S 0.042% and Si traces) 1.77 and 3.23; iron of the Aruco type (C 0.025, Mn 0.035, S 0.025 and P 0.009%) 32.6 and 15.84; sheet aluminum 103.0 and 2.42. Rolled lead (Bi 0.004, Cu 0.005, Fe 0.003 and Sb 0.011%) in 3 hrs lost 259.6

11

THE POLAROGRAPHIC DETERMINATION OF COBALT IN THE PRESENCE OF NICKEL. THE CATALYTIC EVOLUTION OF HYDROGEN IN THE PRESENCE OF COMPLEXES OF COBALT WITH DIMETHYLGLYOXIME. A. G. STROMBERG AND A. I. ZELYANSKAYA (ZHUR. OSHCH. KHIM., 1945, 15, (4/5), 303-317)-(In Russian) A new method has been worked out for the polarographic determination of Co in the presence of Ni. It depends on the fact that dimethylglyoxime gives an insoluble complex with Ni, while forming a complex compound with Co, which remains in solution and can be determined polarographically. The necessary conditions for the determination of Co in the presence of Ni, Cu, Zn, and Fe have been examined.

Chem. Inst. AS, Sverdlovsk

ZELYANSKAYA, A. I.

Mbr., Inst. Chemistry & Metallurgy; Ural Affil., Acad. Sci., -1944-c49-.

"Polarographic Determination of Cobalt in the Presence of Nickel. Catalytic Evolution of Hydrogen in the Presence of Complex Compounds of Cobalt with Diethylglyoxime," Zhur. Obshch. Khim., 15, Nos. 4-5, 1945;

"Study of the Solubility of Dimethylglyoxime in Ammonia and Alcohol Solutions with the Aid of Amperometric Titration," Zhur. Analit. Khim., 4, No. 5, 1949.

PA1149720

USSR/Chemistry - Indicators
Analysis, Quantitative

Sep/Oct 49

"Study of the Solubility of Dimethylglyoxime in Ammonia and Alcohol Solutions With the Aid of Amperometric Titration," A. G. Stromberg, A. I. Zelyanskaya, Inst of Chem and Metal, Ural Affiliate, Acad Sci USSR, 5 $\frac{1}{2}$ pp

"Zhur Anal Khim" Vol IV, No 5, 286-291

In the instance of dimethylglyoxime, expediency of using amperometric titration for determining solubilities of slightly soluble organic compounds is shown. Solubility of this compound in aqueous

149720

USSR/Chemistry - Indicators (Contd)

Sep/Oct 49

solutions at 25° C in relation to composition of solution was studied with: (1) ammonia solutions with an ammonia concentration interval of 0.01-1.0 M and 1.0-10.0 M, (2) ammonium ion-ammonia solutions with a constant ammonia concentration and an ammonium chloride concentration interval of 0.1-1.0 M, and (3) alcohol solutions with an alcohol concentration interval of zero-16.4 M (0.0-96.0 vol %). Submitted 24 Apr 48.

149720

ZELYANSKAYA, A.I.

STROMBERG, A.G.; ZHLYANSKAYA, A. I.

Amalgam polarography. Trudy Kom. anal. khim. 4:5-28 '52.
(Amalgams) (Polarography) (MIRA 11:6)

SOV/137-59-1-2171

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 285 (USSR)

AUTHORS: Zelyanskaya, A. I., Bykov, I. Ye., Gorshkova, L. S.

TITLE: On the Separation of Selenium and Tellurium by a Cationite
(K voprosu o razdelenii selena i tellura kationitom)

PERIODICAL: Tr. In-ta metallurgii, Ural'skiy fil. AN SSSR, 1957, Nr 1, pp 151-154

ABSTRACT: For a quantitative separation of Se from Te, as well as from Ce, Fe and Zn, pH 1.4 solutions are passed through the "espatig" [trans-literated] KU-1 cationite. Te, Cu, Fe, Pb, and Zn are completely absorbed by the cationite. Te is then extracted with a solution of NH_4OH (1:2), and the cationite is washed with H_2O and 5% HCl to a neutral reaction. It is shown that Se can be quantitatively separated from Cu, Fe, and Zn. The presence of Pb lowers the results. Hydrochloric acid solutions and ammoniacal solution containing sodium versenate are suitable for separating Se and Te from Cu, Fe, and Zn. Se passes through into the filtrate in all cases.

V. P.

Card 1/1

ZELYANSKAYA, A.I.; BYKOV, I.Ye.; GORSHKOVA, L.S.

Polarographic determination of tetravalent selenium and tellurium
when both are present. Trudy Inst. met. UFAN SSSR no.1:155-160
'57. (MIRA 11:9)

(Selenium) (Tellurium) (Polarography)

SOV/137-58-11-23831

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 280 (USSR)

AUTHORS: Zelyanskaya, A. I., Bykov, I. Ye., Gorshkova, L. S.

TITLE: Effect of Heavy Metals on the Polarographic Waves of Selenium and Tellurium (Vliyaniye tyazhelykh metallov na polyarograficheskiye volny selena i tellura)

PERIODICAL: Tr. In-ta metallurgii. Ural'skiy fil. AN SSSR, 1957, Nr 1, pp 161-169

ABSTRACT: The authors investigate the effect of some heavy metals on the polarographic waves of Se and Te in the $\text{NH}_3\text{NH}_4\text{Cl}$ solution. The Cu wave precedes the Te wave, and two separate waves appear on the polarogram, but when the ratio $\text{Cu:Te} > 1$ the Te wave is appreciably lowered and a preliminary separation of Cu is necessary. Zn, which is reduced at a more negative potential, does not affect the Te wave; however, at a $\text{Te:Zn} > 1$ ratio Te lowers the Zn wave. Pb adsorbs Te when it precipitates; when Na versenate B is added, Pb is reduced at a more negative potential than Te, whereas the addition of gelatine displaces the $E_{1/2}$ of Pb to -1.3 v. The presence of 0.05% gelatine completely suppresses the Pb wave, after which the determination

Card 1/2

SOV/137-58-11-23831

Effect of Heavy Metals on the Polarographic Waves of Selenium and Tellurium

of Te proceeds without impediments. The impeding effect of Fe is eliminated by the addition of 0.1 mole/liter of tartaric acid and 0.1% gelatin; in this case Fe is reduced at a more negative potential than Te and has no effect on the magnitude of its wave. Determination of Se is impeded by the presence of Cu, Pb, Cd, and Fe. When the molar concentration ratio $\text{Te:Se} > 1$ Te also impedes the determination. The effect of Zn, Ni, and Co^{2+} is eliminated by the addition of Na versenate B.

N. B.

Card 2/2

ZELYANSKAYA, A. I.

Collection of Studies in the (~~USSR~~) Metallurgy of Heavy
Non-Ferrous Metals, Sverdlovsk, 1957, 168 (Its Trudy, vyp 1,)(AS USSR, Ural Affil,)
Zelyanskaya, A.I.; Bykov, I.Ye.; and Gorshkova, L.S. The Separation of
Selenium and Tellurium by a Cationite 151

Zelyanskaya, A.I.; Bykov, I.Ye.; and Gorshkova, L.S. Polarographic
Determination of Tetravalent Selenium and Tellurium When Jointly Present 155

Zelyanskaya, A.I.; Bykov, I.Ye.; and Gorshkova, L.S. Effect of Heavy
Metals on the Polarographic Waves of Selenium and Tellurium 161

AVAILABLE: Library of Congress

~~Card 6/6~~

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1-22-59

Zelyanskaya, E. E. A.I.

B-12

USSR/Physical Chemistry - Electrochemistry.

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3980.

Author : I.Ye. Bykov, A.I. Zelyanskaya.

Inst : Academy of Sciences of USSR.

Title : Influence of Tellurium on Polarographic Wave of Selenium.

Orig Pub: Izv. vost. fil. AN SSSR, 1957, No 2, 47-51.

Abstract: The presence of SeO_3^{2-} does not influence the height of the TeO_3^{2-} wave on the background of 0.5 M NH_4Cl + 0.5 M NH_4OH . The height of the SeO_3^{2-} wave does not change up to $\text{Te} : \text{Se} = 1$. The SeO_3^{2-} wave becomes lower at a higher relative content of TeO_3^{2-} . In the author's opinion, Se^{2-} ions forming at the SeO_3^{2-} reduction diffuse into the solution and react with TeO_3^{2-} as follows:
 $2\text{Se}^{2-} + \text{TeO}_3^{2-} + 6\text{H}^+ \rightarrow 2\text{Se} + \text{Te} + 3\text{H}_2\text{O}$. In order to verify this assumption, a SeO_3^{2-} solution was electrolyzed on a carbon cathode, after which an anode-cathode wave was revealed on the

-18-

Card : 1/2

... No 2, 1958, 3980.

B-12

polarogram. The SeO_3^{2-} wave remained unchanged after the addition of this solution to another containing SeO_3^{2-} and TeO_3^{2-} , but the TeO_3^{2-} wave disappeared at the excess of Se^{2-} ; the anode Se^{2-} wave appeared correspondingly. See also RZhKhim, 1955, 29202.

APPROVED FOR RELEASE 07/19/2001

Card : 2/2

-19-

137-58-4-8652

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 333 (USSR)

AUTHORS: Zelyanskaya, A. I., Bausova, N. V.

TITLE: Separation of Gallium from Zinc, Copper, Cobalt, Nickel, and Iron by Ion Exchange (Otdeleniye galliya ot tsinka, medi, kobal'ta, nikelya, i zheleza metodom ionnogo obmena)

PERIODICAL: Izv. vost. fil. AN SSSR, 1957, Nr 7, pp 51-53

ABSTRACT: Polarographic determination of Ga in a passive electrolyte of the following composition: 0.1 M Na salicylate, 0.1 M NaCl, pH 2.5-3.8 is inhibited by Co, Ni, Zn, and large amounts of Cu. SBS cationite was used in the Na form in columns of 1 cm diameter, 50 cm high, to remove the inhibiting impurities. The resin, of 0.25-0.5 mm grain size, was charged to a height of 25 cm. A 100-cc solution containing 15 cc concentrated NH_4OH and 10 cc 2N. NaOH was transmitted through the resin at a rate of 5 cc/min, as a result of which the Ga remained in the filtrate in its entirety, and the Ni, Co, Zn, and Cu underwent quantitative absorption by the cationite. The resin was washed by a 100-cc solution containing 10 cc concentrated NH_4OH and 5 cc 2N. NaOH. The filtrate and the wash waters were evaporated down to a

Card 1/2

137-58-4-8652

Separation of Gallium (cont.)

volume of 25 cc and were neutralized by 6N HCl (methylorange test), and the Ga was determined polarographically. Extraction of the Ga in the filtrate attained 98-100% when the solution contained 0.5-5.0 mg.

1. Gallium--Determination 2. Gallium--Separation 3. Gallium--Polarographic analysis 4. Ion exchange resins--Applications Z.G.

Card 2/2

SOV/137-58-11-23830
Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 280 (USSR)

AUTHORS: Zelyanskaya, A. I., Bykov, I. Ye., Gorshkova, L. S.

TITLE: Polarographic Determination of Quadrivalent Selenium and Tellurium
When Both are Present (Polyarograficheskoye opredeleniye chetyrekh-
valentnykh seleni i tellura pri sovmestnom ikh prisutstvii)

PERIODICAL: Tr. In-ta metallurgii. Ural'skiy fil. AN SSSR, 1958, Nr 1, pp 155-
160

ABSTRACT: It is established that for the joint polarographic determination of
Se and Te a basic electrolyte containing (in mole/liter) NH_4Cl 0.75,
 NH_4OH 0.25, Na_2SO_3 0.1 is the most suitable. In order to eliminate
the maxima, the polarographic analysis is performed in the presence
of 0.002% gelatine: $E_{1/2}$ of Te = - 0.9 v and $E_{1/2}$ of Se = - 1.5 v (sat-
urated control electrolyte). An increase in the concentration of gela-
tine causes a displacement of the Se wave in the negative sense, and
its determination becomes impossible. Se can be determined polaro-
graphically at concentrations of 0.05-2 $\mu\text{mole/liter}$; the molar concen-
tration of Te should not be higher than the Se concentration lest the
Se wave be lowered. Nitrates and heavy metals should be absent. To

Card 1/2

SOV/137-58-11-23830

Polarigraphic Determination of Quadrivalent Selenium and Tellurium (cont.)

dissolve Se and Te the precipitate of elemental Se and Te is obtained by any method and to this, together with the filtrate, 5 cc of freshly prepared solution of 25 mg KClO_3 in HCl (1:1) are added. The mixture is stirred, heated slightly, and upon dissolution neutralized with NH_4OH to methyl orange. The solution together with the paper, is transferred into a 50-cc flask, basic electrolyte is added to the mark, and the mixture is analyzed polarographically. The method was verified on specimens of dust and cake. Two-gram samples were used for the analysis.

N. G.

Card 2/2

SOV/137-59-2-4765

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 2, p 343 (USSR)

AUTHORS: Zelyanskaya, A. I., Bausova, N. V., Kukalo, L. Ya.

TITLE: Study of Polarographic Properties of Gallium and Indium (Izucheniye polyarograficheskikh svoystv galliya i indiya)

PERIODICAL: Tr. In-ta metallurgii. Ural'skiy fil. AN SSSR, 1958, Nr 2, pp 263-274

ABSTRACT: Investigations were carried out for establishing the optimum conditions for polarographic determination of Ga and In. It was established that in acid salicylate solutions (0.1 M Na salicylate and 0.1 M NaCl with a pH of 2.5 - 3.8) Ga forms a well defined wave with $E_{1/2} = -0.99$ v (in saturated standard electrolyte); introduction of gelatin has a negative effect. The electrode reaction corresponds to a three-electron reduction and proceeds irreversibly. With an increase of the salicylate content in the solution $E_{1/2}$ shifts in the negative sense. The polarographic determination is not impeded by Al, As^{5+} , Mn^{7+} , and small amounts of Cu, Bi, Sb, Fe, In, Cd, Pb, and Tl. Zn, Ni, Co, Mo, and Sn should be first removed. In is read polarographically against the background of 3N HCl in the presence of 0.01% solution

Card 1/2

SOV/137-59-2-4765

Study of Polarographic Properties of Gallium and Indium

of gelatin; $E_{1/2} \approx -0.78$ v. An increase in gelatin concentration decreases sharply the intensity of the diffusion current.

N. G.

Card 2/2

SOV/137-59-2-4837

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 2, p 353 (USSR)

AUTHORS: Bykov, I. Ye., Zelyanskaya, A. I., Gorshkova, L. S.

TITLE: Polarographic Determination of Tetravalent Selenium and Tellurium
(Polyarografiya chetyrehvalentnykh selena i tellura)

PERIODICAL: Tr. In-ta metallurgii. Ural'skiy fil. AN SSSR, 1958, Nr 2, pp 275-279

ABSTRACT: The authors examined the parameters of the polarographic determination of Se and Te. In acid solutions their reduction proceeds with formation of several waves, whereas in strong alkaline solutions the Se-wave disappears. Polarographic determination of Se and Te when both are present is carried out in an electrolyte of the following composition (in mole/liter): NH_4Cl 0.5, NH_4OH 0.5, Na_2SO_3 0.1, gelatin 0.002%, at a pH ~9. With a concentration of gelatin $\geq 0.01\%$ the Se wave blends with the terminal ascending branch of the polarogram. In the presence of a number of heavy metals a decrease of the diffusion current of Se and Te is observed; moreover, the Se wave decreases in the presence of Te. However, in small amounts of the elements the dependence of the Se wave on Te is imperceptible. The authors developed a technique

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SOV/137-59-2-4837

Polarographic Determination of Tetravalent Selenium and Tellurium

for determination of Te in the presence of Fe (in a tartaric-acid solution), or Te in the presence of Pb, of Se in the presence of Zn (in an E.D.T.A. solution), and of Te in the presence of Cu (alkaline cyanide solution). In order to determine Se and Te in products of complex composition it is necessary to separate them from other elements first.

N. G.

Card 2/2

SOV/137-58-11-23803

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 275 (USSR)

AUTHORS: Zelyanskaya, A. I., Bausova, N. V.

TITLE: Polarographic Investigation of the Gallium Salicylate Complex
(Polyarograficheskoye issledovaniye salitsilatnogo kompleksa galliya)

PERIODICAL: Izv. Sibirsk. otd. AN SSSR, 1958, Nr 3, pp 52-59

ABSTRACT: The authors established the feasibility of the polarographic determination of Ga against a background of 0.1M solution of Na salicylate and 0.1M solution of NaCl at a pH of 2.5-3.8; the addition of gelatin produces a negative effect. The stability of the Ga salicylate complex is comparatively low because the constant of instability $K = 1.93 \cdot 10^{-6}$. The potential of the half wave of Ga = -0.988 v (saturated electrolyte). The electrode reaction is irreversible and corresponds to a 3-electron reduction. W, Al, Mn^{7+} , As^{5+} , alkaline, and alkaline-earth metals do not impede the reaction; neither does Fe at a ratio Ga:Fe $\leq 1:35$. Cu, In, Tl, Cd, Pb, and Sn are reduced at more positive potentials and in small amounts have no effect. Mn^{2+} is reduced close to Ga, therefore it should be oxidized to Mn^{7+} . Under these conditions Bi

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SOV/137-58-11-23803

Polarographic Investigation of the Gallium Salicylate Complex (cont.)

is hydrolyzed; however, when its content is ≤ 10 mg, no adsorption of Ga is observed. Sn is hydrolyzed causing an adsorption of Ga; therefore, its preliminary removal is necessary. The presence of Mo impairs the polarographic wave of Ga. Zn, Ni, and Co impede the determination of Ga owing to the proximity of their reduction potentials.

N. G.

Card 2/2

STASHKOVA, N.V.; ZELYANSKAYA, A.I.

Polarographic determination of germanium. Izv.Sib.ots. AN SSSR
no.1:59-66 '59. (MIRA 12:4)

1. Ural'skiy filial AN SSSR.
(Germanium--Analysis) (Polarography)

PHASE I BOOK REPLICATION

Albatseniyevskiy bank 6532. Ural'skiy filial. Institut metallurgii

oprosy kontrola i kompleksovo ispol'zovaniya svyaz v metallurgii
(Problems of Control and Complete Utilization of Raw Materials in Metal-
lurgy) Sverdlovsk, 1960. 104 p. (Series: Na: Izv., vyp. 3) Enza
also inserted. 1,000 copies printed.

Resp. Eds.: M. I. Lozman, and V. P. Chernobrovkin, Candidates of Technical Sciences. Ed. of Publishing House: I. M. Daria; Tech. Eds.: L. A. Immodanov, and N. V. Shredtina.

FUNDS: This collection of articles is intended for technical personnel of metallurgical plants and for members of scientific research institutes.

Coverages. The collection contains articles discussing a variety of problems pertaining to manufacturing alloys, number of articles devoted to alloys for fastening the parts of aircraft and engines and rivet changes with these properties undergo as a result of the effect of temperature and other factors. Findings of x-ray are summarized in numerous articles and promises to be used for manufacturing ferroalloys and metallurgical steels are suggested. Characterizations of various metal compounds are given as a means for the most efficient utilization of ores are indicated. Some of the articles are devoted to the study of problems of manufacturing ferroalloys, ferroalloys, raw materials. The selection of topics was made on the basis of the importance of the material relating to the quality control of alloys and the manufacturing process employed to produce them. In personalities are mentioned. Each article is accompanied by references, most of which are foreign.

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Rate of Chlorination of Magnesium Oxide

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Figure 1. A schematic diagram of the experimental setup. The subject is seated in a chair, viewing a video screen. The screen displays a target (a small circle) and a starting point (a larger circle). The subject's hand is positioned at the starting point. The distance between the starting point and the target is labeled as d . The subject is instructed to move their hand from the starting point to the target. The video screen is positioned at a distance of 20 cm from the subject's hand. The starting point is marked by a small circle, and the target is marked by a larger circle. The distance between the starting point and the target is labeled as d . The subject is instructed to move their hand from the starting point to the target. The video screen is positioned at a distance of 20 cm from the subject's hand. The starting point is marked by a small circle, and the target is marked by a larger circle. The distance between the starting point and the target is labeled as d .

Figure 1

ZELYANSKAYA, A.I., GORSHKOVA, L.S.,

Determination of small amounts of selenium in anode copper.

Trudy Inst.met.UFAN SSSR no.5:137-139 '60. (MIRA 13:8)

(Copper--Analysis) (Selenium--Analysis)

ZELYANSKAYA, A.I.; GORSHKOVA, L.S.

Polarographic method of determining tellurium in copper-
bearing and leaded compounds. Trudy Inst.met.UFAN SSSR
no.5:141-144 '60. (MIRA 13:8)
(Polarography) (Tellurium)

STASHKOVA, N.V.; ZELYANSKAYA, A.I.

Mechanism of the reduction of tetravalent germanium on dropping
mercury electrodes. Izv.Sib.otd.AN SSSR no.1:72-81 '61.
(MIRA 14:2)

1. Ural'skiy filial AN SSSR.
(Germanium) (Electrodes, Dropping mercury)

ZELYANSKAYA, A.I.; KUKALO, L.Ye.

Polarographic reduction of gallium in a pyrocatechol solution.
Zhur.anal.khim. 18 no.6:726-728 Je '63. (MIRA 16:9)

1. Institute of Metallurgy, Ural Branch of the Academy of Sciences
of the U.S.S.R., Sverdlovsk.
(Gallium compounds) (Polarography) (Pyrocatechol)

ZELYANSKAYA, A.I.; STASHKOVA, N.V.

Amperometric titration of germanium with a pyrocatechol solution. Zhur.
anal. khim. 16 no. 4:430-432 J1-Ag '61. (MIRA 14:7)

1. Institute of Metallurgy, Academy of Sciences U.S.S.R., Ural
Branch, Sverdlovsk.
(Germanium—Analysis) (Pyrocatechol)

ca

18

Extraction of bromine from sylvinite. Ya. Vil'nyanskii and V. Zelyanskii. *Kazh* 1935, No. 2, 12-17.
Despite the low content of Br (0.05%) in Solikamsk sylvinites, it can be extd. economically. The best results are obtained with a mother liquor concn. to 0.08% Br before extn. with Cl₂. S. L. Madorsky

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

The limit of accumulation of bromine in sylvite solution. E. Ya. Vil'nyanskii and V. Zelinskii. Kalit
(U. S. S. R.) 1936, No. 3, 32-4.—A discussion. A. Pestoff

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CA

PROCESSES AND PROPERTIES INDEX

THE LIMITS OF ACCUMULATION OF BROMINE IN CYTRIC ACID
 tion. E. Ya. Vil'yanski and V. Zelyanski. *Khim*
 (U. S. S. R.) 1986, No. 8, 82-4.—A discussion
 A. Fried

USSR-SLA METALLURGICAL LITERATURE CLASSIFICATION

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1ST AND 2ND COLUMNS										3RD AND 4TH COLUMNS									
PROCESSES AND PROPERTIES INDEX																			
<p>co</p> <p>The cooling of syrialite solutions in vacuo. Ya. R. Vil'nyanskii and V. Zelyanskii. <i>Kadil</i> (U. S. S. R.) 1935, No. 7, 16-22. A description of different app. and their operations. A. Pestoff</p>										18									
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<p>EXONI ISVIRIIVAN</p>										<p>EXONI ISVIRIIVAN</p>									
<p>EXONI ISVIRIIVAN</p>										<p>EXONI ISVIRIIVAN</p>									

MEL'NIKOV, Nikolay Prkof'yevich, doktor tekhn. nauk, prof.;
ZELYATROV, V.N., inzh., nauchn. red.

[Development of metal constructions] Razvitie metalliche-
skikh konstruktsii. Moskva, Stroiizdat, 1965. 278 p.
(MIRA 18:7)

MILLER, Viktor Yakovlevich, inzh.; KORCHAGIN, Vladimir
Aleksandrovich, inzh.; TOLOKONNIKOV, Vladimir Gerasimovich,
inzh.; MUKHANOV, K.K., kand. tekhn. nauk, retsenzert;
KUZNETSOV, V.V., inzh., retsenzert; ZELYATROV, V.N., inzh.,
nauchn. red.

[Steel structures in a blast furnace - gas purification
complex] Stal'nye konstruktsii kompleksa domennoi pechi i
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BROUDE, B.M., doktor tekhn.nauk; BORODINA, I.S., red.izd-va;
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ZELYATROV, V.N.; MEL'NIKOV, N.P.; ZUBKOVA, M.S., red.; SHEVCHENKO,
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prof., retsenzent; ZELYATOROV, V.N., inzh., nauchn. red.

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stroitel'stvu
(Steel, Structural)

PODLIPSKIY, Aleksandr Alekseyevich; ZELYATROV, V.N., nauchnyy redaktor;
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[Steel trusses for roofs] Stal'nye prutkovye konstruksii pokryti.
Moskva, Gos. izd-vo lit-ry po stroit. i arkhitekture, 1954. 141 p.
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BALDIN, V.A., kandidat tekhnicheskikh nauk, redaktor; ZELYATROV, V.N.,
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Pod red. V.A.Baldina. Moskva, Gos. izd-vo lit-ry po stroit. i arkhitektуре, 1956. 210 p.
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(Steel, Structural)

LESSIG, Yevgeniy Nikolayevich; LILYEV, Aleksandr Fedorovich; SOKOLOV,
Aleksandr Georgiyevich; ZELYATROY, V.M., nauchnyy redaktor;
ROSTOVTSSEVA, M.P., redaktor izdatel'stva; TOKER, A.M., tekhnicheskiy redaktor

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Moskva, Gos. izd-vo lit-ry po stroit. i arkhitekture, 1956. 479 p.
(Sheet steel) (MLBA 9:12)

ZELYAYEV, A.F.; SHUMOV, K.M.; ALEKSEYEV, Ye.N.

Diaphragm tensometric manometer. Zav.lab.22 no.11:1368-1369 '56.
(Manometer) (MLRA 10:2)

PROCESSING AND PROPERTIES INDEX	
CA	<p>The direct action of chemical stimuli upon the fundal part of the stomach. G. P. Zel'voni. <i>Bull. biol. med. expil. U. R. S. S. 9, 423-7(1940)(in English).</i>—The administration of beet juice to dogs with gastric fistulas has a strong stimulating effect on gastric secretion when the juice is given in dil. soln. Concd. juice has a lesser effect. The administration of the juice to dogs with Pavlov pouches inhibits secretion at all concentrations. Na oleate and NaCl in 0.5% concn. completely inhibit secretion of the Pavlov pouch when introduced into the pouch, but secretion is incomplete on introduction into the stomach, possibly because of stimulation of the pylorus. Secretion is enhanced by 3% NaCl while no change is observed with 3% NaCl. Administration of 50-100 cc. of sunflower oil into the pouch completely inhibited gastric secretion but this was not observed when 25-30 cc. was used. In exper. with the Heidenhain pouch no changes were observed. Conclusion: Certain chem. stimuli applied to the fundal part of the stomach, although not eliciting gastric secretion, regulate the secretion called forth by other means from other parts of the organism. S. A. Karjala</p>
<p>ASAC, U.S.A. METALLOGRAPHICAL LITERATURE CLASSIFICATION</p>	

ZELYAYEV, A.F.

USSR/Processes and Equipment for Chemical Industries -
Control and Measuring Devices. Automatic Regulation.

K-2

Abs Jour : Referat Zhur - Khimiya, No 9, 1957, 33322
Author : Zelyayev, A.F., Shumov, K.M., Alekseyev, Ye.N.
Inst :
Title : Tensimetric Diaphragm Manometer
Orig Pub : Zavod. laboratoriya, 1956, 22, No 11, 1368-1369

Abstract : In the tensimetric diaphragm manometer developed by the authors the pressure that is being determined distorts a circular steel diaphragm and a wire-resistor primary element fastened thereon. Change in ohmic resistance of the primary element is measured by means of a 4-branch bridge. The manometer consists of a cylindrical housing into which is threaded a cover with an aperture which provides an outlet to the atmosphere. The diaphragm with the primary element fastened thereto is clamped between housing and cover. On a plate that is located on the cover is fastened a

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USSR/Processes and Equipment for Chemical Industries -
Control and Measuring Devices. Automatic Regulation.

K-2

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 33322

primary element which compensates the temperature distortion of the primary element of the diaphragm. Pressure from the system under study is admitted into a bottom chamber through a connection tube. The apparatus is suitable for measuring static and dynamic pressure and vacuum. With a relative distortion of the diaphragm not exceeding 0.2-0.25% the apparatus has a rectilinear response. In the experimental studies diaphragms 50 mm in diameter were used. Use of a diaphragm of larger diameter is disadvantageous since on increase of the diameter the frequency of the natural oscillations of diaphragms decreases. Diaphragms having a thickness from 0.1 to 7 mm were used to measure pressures from 0.004 to 900 kg/cm², respectively.

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L 19739-63 EWP(r)/BDS AFFTC/APGC EM
 ACCESSION NR: AT3002160

S/2919/62/000/000/0142/0151

AUTHOR: Zelyukova, R. V.

TITLE: Vibration damping in link rods

SOURCE: Voprosy rasseyaniya energii pri kolebaniyakh uprugikh sistem; trudy nauchno-tehnicheskogo soveshchaniya. Kiev, Gostekhnizdat-USSR, 1962, 142-151

TOPIC TAGS: vibration damping, link rod, logarithmic decrement, forced vibration

ABSTRACT: Experimental and analytical investigations were made to determine the damping capacities of two types of link rods, one having a clearance in the joint and the other with a metallized cover. Experiments were carried out on an apparatus of TsNIITMASH (Central Scientific Research Institute of Technology and Mechanical Engineering) specification. The damping characteristics were obtained on the assumption of a two-term, linear logarithmic decrement, thus

$$\delta(\xi_0) = \delta_0 + k\xi_0$$

(1)

where δ_0 , k - deforming capacity of rod in low and high deformation regions (0.1 kg/mm² and 10 kg/mm² or over) respectively; and ξ_0 - integrated magnitude depending on type and intensity of stress and type of rod under study. Some basic results
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ACCESSION NR: AT3002160

and conclusions drawn from the experiment are: the metallized cover type rod follows a linear damping law given by equation (1) above in the stress range 50-600 and 100-800 kg/cm² with a cover deposit of high carbon steel 1-2.5 mm thick. The parameter δ_0 increases by a factor of 2-5.8 and k increases by 7-11. Furthermore, both types of rods are found to be applicable in carrying vibrational loads under practical operating conditions. On the basis of the assumption that the hysteresis loop of the link rod with an external harmonic forcing function is elliptic in form, equations are derived for rod displacements both in free and forced vibrations. It is shown that the coupling between a large damping factor and the resonance amplitude induce an inherent stability in the vibrating system. Orig. art. has: 11 equations, 4 figures, and 1 table.

ASSOCIATION: none

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SUB CODE: AP

NO REF SOV: 008

OTHER: 001

Card 2/2

ZELYUKOVA, R.V.

Torsional vibrations of steel-wire rope taking into
consideration mechanical hysteresis. Nauch. zap. Od.
politekh. inst. 48:59-65 '62. (MIRA 17:5)